

## DRONE CONTROL SYSTEM

The photo shows a pair of Teledyne Ryan Firebee unmanned drone aircraft being readied for test at White Sands Missile Range, New Mexico. They are part of an Army program in which several types of drones—subscale vehicles like the Firebees and full-scale retired military aircraft—are flown in tests of air defense missile systems. Simulating attacking aircraft in close formation, the drones test the missile systems' capability for discriminating among multiple targets. The drones are precisely controlled by means of a Drone Formation Control System (DFCS) developed by IBM Federal Systems Division, Oswego, New York. The DFCS computer can track 10 drones at once and



control as many as six drones flying in multiple formations or singly on independent flight paths.

When the Army decided to introduce an advanced drone—the QF-100, an unmanned version of the Air Force's Korean War vintage supersonic fighter—IBM was awarded a contract to modify the existing software to accommodate the new drone. As part of the project, Federal Systems Division (FSD) engineers employed a program called ORACLS, which was used in generating new and improved software to track and control QF-100s in formation. Originally developed by Langley Research Center and supplied to FSD by NASA's Computer Software Management and Information Center (COSMIC)<sup>®</sup>, ORACLS provided the numerical calculations required for dealing with multi-input and multi-output control systems. FSD estimated savings of approximately one man-year in avoiding development

of new software had ORACLS not been available.

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